202401UECM3473OE3b

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Review of preview

Started on	Tuesday, 12 March 2024, 12:02 PM
Completed on	Tuesday, 12 March 2024, 12:02 PM
Time taken	10 secs
Marks	0/8
Grade	**0** out of a maximum of 10 (**0**%)

1
Marks: 1

An insured's number of claims per year follows a Poisson distribution with mean λ. λ varies in accordance with a gamma distribution with α = 36 and θ = 0.02. You have the following information on the number of claims made by an insured in the past 8 years:

0, 2, 2, 1, 0, 3, 4, 3

Calculate the predictive variance of the number of claims per year for this insured. ______

Answer: ✗

Make comment or override grade

Incorrect
Correct answer: 0.894471
Marks for this submission: 0/1.

2
Marks: 1

Claim sizes are normally distributed with mean θ and variance 110,000. θ varies by risk, and is normally distributed with mean 1,500 and variance 1,030,000. For a certain risk, 10 claims averaging 1800 are observed. Determine the posterior probability that θ is less than 1932.0. ______

Answer: ✗

Make comment or override grade

Incorrect
Correct answer: 0.9032
Marks for this submission: 0/1.

3
Marks: 1

The number of claims per year on an insurance coverage has a binomial distribution with parameter m = 5 and Q. Q varies by insured and is distributed according to the following density function:

$$f(q) = cq(1 - q)^8, \ 0 \le q \le 1,$$

where c is a constant.
An insured submits 1 claims in 9 years. Calculate the posterior probability that for this insured, Q is less than 0.043000000000000003. ______

Answer: ✗

Make comment or override grade

Incorrect
Correct answer: 0.423213
Marks for this submission: 0/1.

4

We assume that the amount of an individual claim, Y , follows an exponential distribution function with probability density function

$$f(y|\delta) = 1/\delta e^{-y/\delta}, \ y, \delta > 0$$

Marks: 1

The mean claim amount, δ, follows an inverse gamma distribution with density function

$$\pi(\delta) = 3^5 e^{-3/\delta}/(\Gamma(5)\delta^6),\ \delta > 0$$

Suppose 26 claims are observed with total aggregate claim amount of 20. Find $P(Y_{27} > 1 | \Sigma Y_i = 20)$. ______

Answer:

Make comment or override grade

Incorrect
Correct answer: 0.2673
Marks for this submission: 0/1.

5
Marks: 1

For an insurance portfolio with 1426 exposures, you are given:

- The number of claims for each exposure follows a Poisson distribution.
- The mean claim count varies by exposure. the distribution of mean claim counts is a gamma distribution with parameters $\alpha_1 = 0.5$, $\theta_1 = 4$.
- The size of claims for each exposure follows an exponential distribution.
- The mean claim size varies by exposure. The distribution of mean claim sizes is an inverse gamma distribution with parameters $\alpha_2 = 5$, $\theta_2 = 4$.
- the standard for full credibility of aggregate claims is that aggregate claims must be within 7% of expected 90% of the time.

Determine the credibility assigned to this portfolio. ______

Answer:

Make comment or override grade

Incorrect
Correct answer: 0.8801
Marks for this submission: 0/1.

6
Marks: 1

Losses follow a distribution with desity function

$$f(x) = \delta\, x^{\delta-1},\ 0 \le x \le 1$$

δ varies by insured according to a gamma distribution with α = 5, θ = 10. A loss size of 0.49 is observed. Determine the posterior estimate of δ using zero-one loss fuction. ______

Answer:

Make comment or override grade

Incorrect
Correct answer: 6.1474
Marks for this submission: 0/1.

7
Marks: 1

You are given the following:

- Claim sizes for a given policyholder follow a distribution with density function

$$f(x|\backslash\theta) = 4x^3/\theta^4,\ 0 < x < \theta.$$

- The prior distribution of Θ has density function

$$\pi(\theta) = 2/\theta^3, \theta > 1.$$

The policyholder experiences three claim sizes of 400, 600, 1000. Find the upper bound of the 97% "HPD" credible set for θ. ______

Answer:

Make comment or override grade

Incorrect
Correct answer: 1284.63
Marks for this submission: 0/1.

8
Marks: 1

The annual aggregate claim amounts (X) for the past 5 years for a risk is

208, 156, 227, 205, 154.

Suppose X|θ ~ N(θ,v = 430) and Θ ~ N(μ = 200, a = 220), determine the lower bound of the 90% HPD credibility interval for θ. ______

Answer:

Make comment or override grade

Incorrect
Correct answer: 179.91
Marks for this submission: 0/1.

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